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ROCKS AND MINERALS PEEKSKILL, N. Y., U. S. A.

The Official Journal of the Rocks and Minerals Association

ROCKS and MINERALS

Edited and Published by Peter Zodac

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Collecting In The Black Hills

By V. K. OVERMAN, Omaha, Nebr.

The Black Hills region of South Dakota is exceptionally interesting to the mineral collector, for here within a comparatively small area more than one hundred different minerals have been found. Many of these are present in the granites and associated pegmatites, some are deposited in veins or lodes, others are found in the crystalline schists and still others in placers. Each type of deposit has its characteristic minerals.

It is not the purpose of this paper to catalog and describe the various minerals of the Black Hills, but rather to bring to the attention of the collector visiting this region some of the more interesting varieties and to indicate specific places where these may be obtained.

Several miles from Custer is the Pink Rose Lode, a most beautiful body of rose quartz, owned and worked by the Scott Rose Quartz Co. of Custer. This mine is an open cut and the entire face of the workings is a mass of quartz ranging in color from light pink to deep rose. Lovely translucent specimens of excellent color and remarkably free of cracks may be obtained from the owners, and pale-colored specimens more or less opaque are often found beside the roads.

Near Custer, almandine garnet is found in mica schist and in the stream gravels. Some of the crystals are sufficiently transparent and free from flaws for cutting into small gems. Eight miles northwest of Custer, in a pre-Cambrian marble, there are green radiating masses of actinolite associated with light brown phlogopite mica.

Limonite is found near the summit of Iron Mountain, three and a half miles southwest of Keystone. This deposit covers a fairly wide area and runs between fifty-five and sixty per cent iron, besides about $3.00 per ton gold content and some silver, but it has never been worked on a commercial scale. Much of this limonite is iridescent, and many specimens showing a very beautiful surface coloration have been found beside the road which passes over Iron Mountain.

The collector can work to best advantage out of Keystone, for in its immediate vicinity are important pegmatite bodies, as well as several lodes carrying gold, arsenopyrite and pyrite. The Etta, Hugo, Peerless and Bob Ingersoll mines, all located at Keystone, have been worked for the pegmatite minerals. The Holy Terror, Keystone, Columbia and several others have been operated for gold and arsenic. Gold, garnet, staurolite and tiny crystals of zircon, rutile and octahedrite may be obtained by panning the gravel of Battle Creek at Keystone. The yield of gold is very slight as all of these sands and gravels have been worked over several times, but "color" may be found along any of the creeks of this section.

In the early days, Keystone was an important gold-mining town, but the rich ore has been worked out until at present the only important gold production of the Black Hills is carried on by the Homestake mine at Lead. Its stability of earning is not dependent upon high grade ore, but upon highly efficient methods of mining and extracting the gold. The Holy Terror

Courtesy of South Dakota School of Mines.
Etta Lithia Mine Near Keystone, S. D.

mine at Keystone is not being operated at present, but here gold bearing iron pyrite and arsenopyrite may be obtained, as well as mica schist containing crystals of almandine garnet, staurolite and black tourmaline. Small perfect crystals of garnet may be picked up in the road near the entrance to this mine.

There are a number of pegmatite bodies around Keystone which have associated with their usual quartz, feldspar and mica, a great variety of accessory minerals.

The Etta Mine is best known for its huge crystals of spodumene. These are opaque, gray or white in color and often eight or ten feet long. Some have been uncovered that are from thirty to forty feet in length. Spodumene is mined for its lithium content, as are amblygonite and lithiophilite which are found associated with it. Yellow lepidolite, a lithia mica, is here also,

Courtesy of South Dakota School of Mines.
Large Crystals of Spodumene, Etta Mine, Near Keystone, S. D.

but its content is too low to make extraction profitable. Cassiterite in small brilliant black crystals is common, and it is in fact for this tin ore that the Etta mine was first operated. Dark blue apatite and columbite are also found in this mine.

The Hugo mine is worked for feldspar, and is one of the largest bodies of exceptionally pure feldspar in the United States. White microcline is most common, but salmon-colored microcline, pink and white cleavelandite (a platy variety of albite) and gray-white orthoclase are also present. Muscovite mica is another important product of this mine, and it is very common to find much flattened black crystals of tourmaline imbedded between leaves of the mica. Larger nicely terminated crystals of tourmaline are also found. Beryl of a beautiful blue-green color is present in the Hugo, but none has been found sufficiently transparent for gem use.

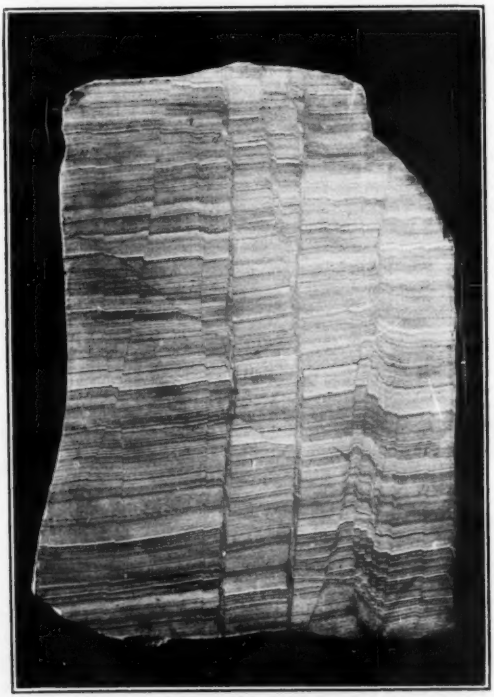
The Bob Ingersoll mine contains most of the usual pegmatite minerals and has massive ledges of deep-lavender lepidolite. This mine contains much white beryl, and specimens of this mineral often show tree-like inclusions of manganese dioxide; but by far the most interesting specimens obtained here are slender transparent crystals of blue-green tourmaline imbedded in silvery mica. There are also larger green crystals, but they are not transparent.

Courtesy of South Dakota School of Mines
Hugo Mine Showing Feldspar Contact, Near Keystone, S. D.

Some copper minerals are found about a mile and a half southeast of Sheridan, and one mine, the Blue Lead, was formerly worked for this metal. Azurite, malachite, chrysocolla and cuprite may be obtained here. The malachite is of a soft green color mottled with Indian red cuprite, and makes very attractive specimens.

The collector interested in rocks will find a great variety in the Black Hills region, but mention will be made of only one. In Calico Canyon near Buffalo Gap, about fifteen miles northeast of Hot Springs, there is a formation of sandstone showing thin bands of white, yellow, purple and dark gray, characterized by block faulting phenomena. The banding and faulting are both on such a small scale that they show to advantage in a three by four inch specimen.

All of the minerals named occur with sufficient frequency to be found by the average collector during a short stay in the Black Hills, and the localities mentioned are readily accessible by good roads.



Courtesy of South Dakota School of Mines
Faulted Sandstone from Calico Sandstone (Specimen in School of Mines Museum)

Tourmaline At Buchanan, N. Y.

By PETER ZODAC, Editor Rocks and Minerals

Buchanan is a little village adjoining Peekskill on the south. It is not a large community as its population is approximately 1500. The Albany Post Road passes through it. Its principal industry is the Standard Textile Works —the world's largest oilcloth manufacturing plant. Its most noted spot is Indian Point, an amusement park, on the Hudson River and one of the important stopping points for the Hudson River Day Line.

Buchanan, whose previous name was Centerville, received its name from the oilcloth factory which was originally started by George Buchanan.

In the fall of 1934, the village let out a water works contract and many trenches and excavations were opened up subsequently. Nothing, even of ordinary interest in the mineralogical line, to the writer's knowledge, was exposed in these trenches until April 1935. During that month a trench was excavated along the south side of Tate Avenue and a black, lustrous mineral was blasted out. The mineral created somewhat of a sensation. It was mistaken for anthracite; children and adults carted home many specimens under the impression it was coal. The writer's attention to this black mineral was called by Mr. Henry Thurston of Montrose, an adjoining village on the south of Buchanan, but it was not until Wednesday, June 26th, that a visit could be made to the locality. The writer was accompanied by Mr. and Mrs. Emmet Doherty of Peekskill.

The first stop was at the office of the engineer in charge of the water works construction, Mr. Malcolm Reinhart, as he it was who first called Mr. Thurston's attention to the mineral. A large specimen was on display in the office and it was immediately recognized as black tourmaline.

Mr. Reinhart, a most efficient and courteous engineer, and a very interesting talker (he has traveled the world over), not only described the mode of occurrence of the tourmaline but also guided the writer to the exact spot where it was encountered. The trench had been entirely filled up and of course the tourmaline bearing rock was no longer visible. But three or four specimens were still available on the surface and these collected. The locality is 35 feet west from the Westchester-Tate Avenues circle on the south side of Tate Avenue.

According to Mr. Reinhart, the top of a pegmatite vein, 18 inches wide and 3½ feet below the surface of the ground, was struck in the trench at the spot mentioned above. The vein consisted of smoky quartz and black tourmaline with some limonitic stains. The country rock of the district is norite, a dark brown crystalline rock. (Mr. Reinhart also stated that emery had been struck in a trench through Rockledge Avenue, which runs west of Westchester Avenue).

Examination of the specimens collected yielded the following interesting information:

Limonite:—Common as brownish stains on smoky quartz and on tourmaline; the stains are of poor quality.

Quartz (Smoky)—Is the main mineral of the pegmatite. It is massive, of good grade though the surface is stained by limonite, and occurs in large amounts.

Tourmaline (Black)—This is the material of most interest. It occurs only in crystal form, lustrous, striated, but fragile. The crystals grade in size from tiny slender ones up to one 8 inches long and 2 inches in diameter. The crystals are all frozen in the quartz.

In some specimens of quartz, the crystals occur sparingly; in other specimens they are so concentrated as to form a mass of crystals which often penetrate or criss-cross one another. In a few instances, the tourmaline was noted radiating from a common center.

Practically every specimen of tourmaline collected shows its crystals divided into many cross-sections, the interstices being filled with smoky quartz often of minute thinness.

One large mass of smoky quartz, 9x9x4 inches, weighing 24½ pounds, contains 8 crystals of which the largest is 8 inches long and 4 inches in diameter, but as both terminations are missing, it evidently must have been much longer. This crystal has been divided into 8 major sections each of which is approximately 1 inch long, and the interstices have been filled with thin veins of smoky quartz which are approximately at right angles to the length of the crystal and parallel to each other. The largest vein of quartz is about ⅛ inch in thickness. Minutely thin veins of quartz which are just about discernable, parallel the major veins; some of the quartz from these veins have spread out vertically to fill cracks in the tourmaline which run up and down. The total length of the veins in this one crystal is just about ¾ inches so that the crystal, that is the part present in the quartz, is not 8 inches long but only 7¼ inches.

A quartz vein in a tourmaline crystal is of uniform thickness and makes a sharp contact with the tourmaline. Although in a few instances minute fragments of tourmaline were noted in the veins, it is the writer's belief the veins do not replace tourmaline but have simply filled in the interstices between the sections. The tourmaline had first crystallized out from the magma, while the quartz was still in a molten condition, then as the quartz began to solidify the tourmaline was fractured into sections and the quartz penetrating these sections had pushed the crystal out the ¾ inches now shown.

The grateful thanks of the writer is extended to Mr. Henry Thurston for calling his attention to the tourmaline; to Mr. Malcolm Reinhart for his very gracious information; to Mr. and Mrs. Emmet Doherty for their interest in visiting the locality and allowing the writer to accompany them; and to Mr. John Burns for trimming the large specimen found. Mr. Burns, a stone cutter who resides across the street from the writer, spent over two hours in trimming the specimen. The results were astonishing! From a specimen that was simply a mass of rock, Mr. Burns evolved a specimen fit for a museum. This was the first instance that the writer ever saw a mineral specimen trimmed by a stone cutter and from now on his advise to mineral collectors will be—Have your large specimens trimmed by a stone cutter.

Labradorite From Nepoktulegatsuk

The first large shipment of Labradorite in many years was brought down in a chartered schooner from the far northern coast of Labrador late last fall, just ahead of the ice which closes the coast to navigation from October to June.

The deposit is on Tabor's Island, called by the Esquimaux Nepoktulegatsuk, and it is famous in geological annals as being the finest and most colorful in the world. The mining rights are owned by Sir Wilfred Grenfell, the statesman-missionary who has done so much to develop the people and the resources of the Labrador.

The expedition to quarry the Labradorite was organized by Louis W. Wheelock, a Philadelphia business man. Last summer he conducted a party of eight to the island, a remote uninhabited mass of rock twelve miles from Nain, in the country of the Esquimaux. The party included Bentley R. Morrison, a mining engineer and geologist, who directed quarry operations. Some two hundred tons of rock were removed by drilling and explosion of minimum charges of dynamite. This was carefully sorted and fifty tons were piled on the shore for loading the schooner. All the selected rock showed good color, mostly the "peacock blue" characteristic of Labradorite, but with occasional green and bronze. The rock was classified in three ways, large masses

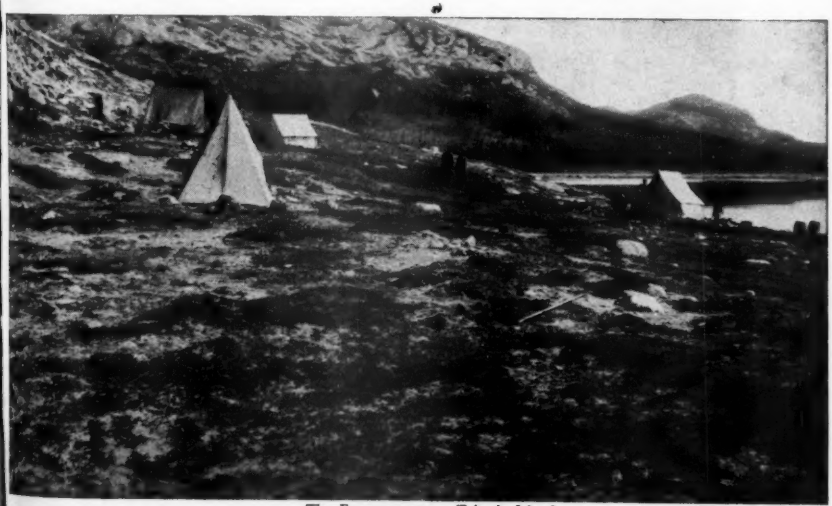
suitable for architectural use, smaller masses of good color for ornamental objects, paper weights, pen set bases, lamp bases and carved pieces. The finest stone of pure color was set aside for the making of jewelry.

The vein of colorful Labradorite when fully uncovered showed a gorgeous mass of iridescence approximately fifty feet wide and twenty feet high set in the surrounding grayish cliff of anorthosite. At the farther end of the island the expedition secured very fine crystals of hypersthene, some of them weighing up to fifty pounds. A small amount of the hypersthene was brought down.

Some remarkably fine results have been obtained in cutting and polishing cabochons and jewels from the crystals. One necklace made of matched Labradorite beads with two hearts as pendants was considered worthy of hand-tooled gold mountings and the finished piece is valued well above a hundred dollars. Other cabochon shapes have been mounted in rings and pins.

The rock is being sold in America and abroad and profits from the operations will be devoted to the Grenfell medical and educational and industrial missionary work in Labrador and Newfoundland.

A Permanent Cutting in the Rock on Tabor's Island to Identify the Quarry as the Property of Sir Wilfred Grenfell



The Encampment on Tabor's Island

The Miocene Lake of Creede, Colorado

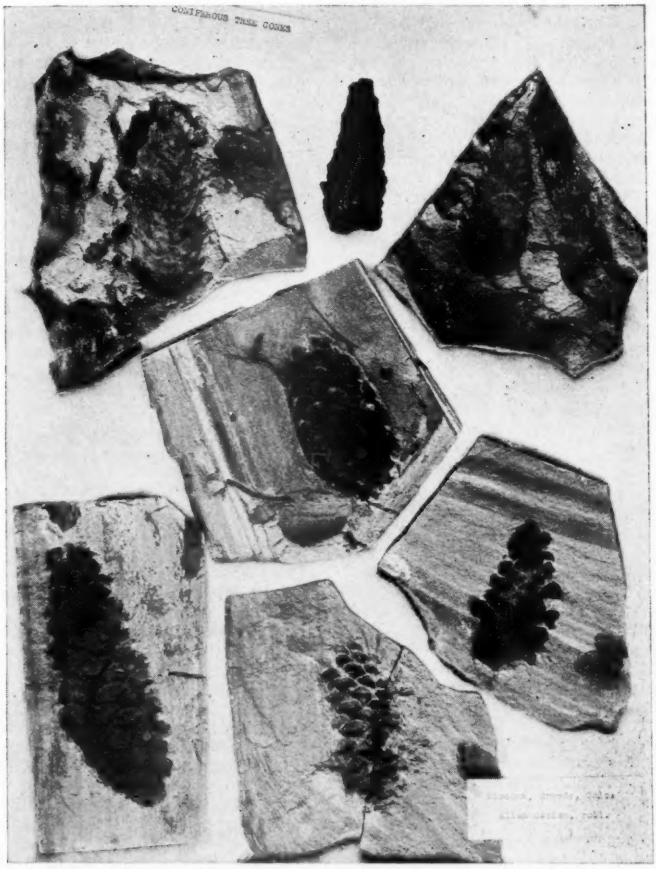
By ALLAN CAPLAN, University of Colorado, Boulder, Col.

Within the mineralized area of the San Juan Mountain region in Southwestern Colorado lies a recently discovered, extinct Miocene lake, similar to the unique and famous Florissant, Colorado deposit. The new beds, which lie near the source of the picturesque Rio Grande River, are situated in the vicinity of the historic mining camp of Creede, famous for its early silver production and gun-play of the early days. As the crow flies, the Creede Miocene formation (upper Miocene) is one hundred miles southwest of Florissant; and also, one thousand feet higher in elevation.

The formation was deposited in a deep steep-walled basin, which is now the present valley of the Rio Grande; it is now bordered by the bare, rugged mountains of the Continental Divide to the north, and a smaller fir-covered ridge of the San Juan Mountains on the southwest. The lake is horseshoe-shaped, similar to Florissant, but covers considerable more area. While Florissant is two miles wide and five miles long, Creede is also two miles wide, but at least twenty miles long. (Erosion has washed away the upper part of the lake which extended into the smaller mountain valleys). The thickest and finest sediments are found near the center of the lake which, incidentally, is at the arc of the great horseshoe.

The lower beds, exposed by the Rio Grande River, are composed of coarse gravel; the upper beds are formed of a coarse, brown colored shale composed mainly of tuff, but the best fossils are collected from strata of light colored, thinly laminated tuffs from the uppermost part of the formation. Throughout the entire deposit, concretions from one inch to several feet in diameter are found; fossils have not been found in any of those cracked open, although a peculiar hard and quartz-like core is present in most of them. Ripple marks are uncommon;

Collecting Fossils Above the Rio Grande River



A Choice Collection of Cones—(Notice the original cone and the crusts).

these are found in the vicinity of horseshoe arch. Travertine is found along the lake border, and in some places the deposit is somewhat thick. A most interesting fact is the present occurrence of hot springs at Wagon Wheel Gap, eight miles below Creede.

The fossils found are of the same nature of the Florissant discoveries; but since the beds are one thousand feet higher than those of Florissant, the species of fossils found at Creede are slightly different. The plants, which are most abundant, are the conifers; these are very common. Excellent specimens of beautifully preserved cones are frequently found, as well as small branches and daintily tinted seeds. (Incidentally, one of the most common insects is a Saw-Fly, the larvae of which feeds on the wood of conifers). Flowers, at some "diggings" are common, and many small excellent specimens have been discovered. Current, poplar, ash, and willow leaves are common, as well as

grasses and plant fragments. Shells have been found recently in the light colored laminated shales; these are gastropods, but they have all been slightly crushed. The abundance of well-preserved bird feathers is surprising, for good bird feathers are uncommon at Florissant. Insects are not as numerous as in the Florissant beds, but the difference is due to the difficulty of extracting laminated shales; for the beds have been covered with river boulders, and the best localities are exposed only by erosion. Although little digging has been done at Creede, one butterfly, two and a half inches across, has been found; (not well preserved), and this is a satisfactory indication of the possibilities of the Creede beds. Throughout the many years of extensive digging at Florissant, only ten butterflies have been found, most of which were not good specimens. The most interesting occurrence of fossils at Creede, however, is the abundance of conifers. These are so much more abundant at Creede than at the Florissant beds that more indication is really not needed to prove that Creede was always about a thousand feet higher than Florissant since Miocene times. One day of collecting at Creede (in the proper place) will produce more cones than can be obtained at an entire summer's digging at Florissant—and then some.

The Creede beds are new; they offer great possibilities for new discoveries. To the paleontologist, the zoologist, and the botonist, the deposit should prove invaluable; for the comparison of the life zones of Miocene times, especially in the west, is now possible.

Above all, the new Creede beds are believed to be the highest known deposit of Tertiary plants and insects in the world—the elevation is almost 9,000 feet!

A GEOLOGICAL OUTING

A number of members of the Rocks and Minerals Association in the Metropolitan District of New York, have expressed themselves in favor of a geological outing to be held in November. The area chosen is Peekskill, where the three great classes of rocks igneous. sedimentary and metamorphic are well exposed. Dikes, faults, contacts, glacial phenomena, etc. are numerous and well pronounced.

Those in favor of the outing and who would attend are requested to write the Editor, ROCKS and MINERALS, Peekskill, N. Y.—a post card will do.

WITH OUR ADVERTISERS

Gems of the Rockies Shop have moved their fine stock of minerals from 315 Angle St., Rock Springs, Wyo., to Green River, Wyo. (P. O. Box 299).

C. L. Brock, manager of the American Mineral Exchange, 212 Pacific Ave., Houson, Texas, has recently visited Magnet Cove, Ark. where he collected many fine specimens.

John Grenzig, 299 Adams St., Brooklyn, N. Y. has taken over the extensive stock of Western minerals owned by Arthur Montgomery of New York City.

New Haven Mineral Club

A number of field trips for the summer have been arranged and members and their friends are urged to attend each and every one of them. The next one will be Sunday, Oct. 20th, Iron Mines, Ore Hill, Salisbury, Conn.

Members will meet at 9:00 A. M. (D. S. T.) at Peabody Museum, New Haven, Conn., at the mines at 10:00 A. M. (D. S. T.). Those having cars with room for an extra passenger or two, are requested to pick up members.

The Mauch Chunk Carnotite

By RICHMOND E. MYERS

Some time ago the Editor suggested that I write an article for ROCKS and MINERALS on the Carnotite deposits of Mauch Chunk. There is little that I can add to what has already been written concerning these deposits which prove that all the Carnotite in the United States is not found along the Colorado-Utah state line. Others far better fitted for the task have adequately described the Mauch Chunk material, but for the benefit of the readers of this magazine I will more or less summarize what they have said, and add a bit from my own observation.

This Mauch Chunk Carnotite occurs in a small area in the Pottsville Conglomerate on the side of Mt. Pisgah just outside of the city. This formation is fairly rich in the yellow Carnotite stains, and is made up of crudely stratified masses of pebbles, mostly quartz although some are calcite, varying in size from some as small as B B shot, to others almost as large as golf balls. These pebbles are cemented together by silica or calcite. The beds of the formation show much evidence of considerable slipping by well marked slickenslides.

The Carnotite appears on this slickenslide surface where it looks as if someone had smeared dobs of yellow paint at random, but as a rule it is more or less evenly distributed through the pebbles, filling the cracks in and between them. Often it is seen in the cementing material, where it appears to be replacement. Some of the Carnotite splotches are quite large, as they vary in size from a few inches to several feet in width.

One can not say how far into the mountain these deposits reach, however the chances are that they do not extend far below the surface, probably not below the water table, for their deposition probably took place in circulating surface water. As a matter of fact one can readily observe water dripping through the conglomerate today, and it is fairly safe to assume that the early deposits were precipitated.

Several theories are advanced with regards to the origins of the Uranium and Vanadium that were originally dissolved in the water that in turn deposited the Carnotite. The first: assuming the beds to be of marine origin, is simple, and is merely that these elements were precipitated from sea water, for we know that both are found in the ocean today in minute quantities. The second assumes the possibility of these elements having been present in the earlier rocks of these regions, and that they were more or less washed down as alluvial deposits into a basin of continental deposition, where they collected. This could have been possible, as both Uranium and Vanadium minerals are present in the pegmatites and gneisses of this district.

As far back as 1874 Genth noted the presence of a Uranium mineral on the slopes of Mt. Pisgah, yet he did not call it Carnotite. Not until 1908 was it identified as such by Wherry. No commercial operations seem to have been made for mining the deposits, but the cutting of a roadbed to a trolley line between Mauch Chunk and Lansford some years ago opened up a considerable area to the delight of the mineral collectors. Recently the cutting of a state highway (U. S. Route No. 309) has made deeper inroads on the mountain, opening more of the yellow deposits to those interested. The location is easily reached. Start from Jersey Central Railroad Station in Mauch Chunk, head north and then west, turning with the highway around the mountain. Go ahead by the bridges that cross the Lehigh, but NOT over them. One and one-tenth mile from the station observe the wall of rock to the left of your car, and you will be rewarded. The rock is quite hard to work. Sledge hammers and crowbars can be used to advantage. At the time of writing there seems to be some preparation for road construction work going on right by these deposits. In all likelyhood the state contemplates widening the road. If this will mean cutting back into the mountain it will probably prove fruitful in opening up more of the deposits. At any rate, the work will bear watching.

The Cleaning And Restoration of Specimens of Native Copper

By O. IVAN LEE

A great deal of useful technical information recorded in the literature is for various reasons not utilized as it should be. It may be on file only in the large and special libraries found only at the universities or in cities, it may be buried in rare or unusual books, or it may be so obscurely indexed that the knowledge sought can not be readily located. Finally, the very existence of such information may be quite unsuspected by those who wish for and need it most.

Recently the writer acquired a choice specimen of arborescent crystallized native copper from a collection formed thirty years ago in Arizona. Although its odd form and striking weight always attracted interest and attention, many failed at first to realize its true nature because age and exposure had so blackened, discolored and encrusted it that its metallic character was completely masked. It was desired, therefore, to find some chemical treatment which would rejuvenate the specimen and restore it to its original metallic aspect without in any way damaging it, or even betraying by its appearance the fact that it had been so treated. Of course, cold acid dips would effectually remove the adherent films of discoloration, but unfortunately would not stop there, but would attack the metal itself, etching and dimming the more brilliant surfaces, especially those of crystals. Furthermore, the specimen would emerge from such baths of a beautiful but unnatural rose red color. Ammonia in connection with copper is not to be thought of, as it tends to invade the crystal interstices and is quite capable of eventually disintegrating a specimen. The problem seemed a knotty one, and careful and prolonged search of the chemical literature gave no helpful hints, but mere chance finally disclosed the precise formula sought.

One day while browsing in a university library searching the chemical literature on an unrelated subject, two small books were noticed whose contents aroused curiosity. They were entitled "The Cleaning and Restoration of Museum Exhibits," Second (1923) and Third (1926) Reports, published by the British Museum, London, and dealt with the special methods evolved through necessity, of cleaning and restoring museum objects of great age, delicacy and value. As many of these are of metallic composition, interest was at once sharpened, and a brief search disclosed the long-sought formulas for cleaning copper and its alloys. The preferred formula was at once tried and found to be ideal for the purpose in mind, so it is herewith passed on to collectors and readers of "ROCKS and MINERALS."

Formula for a Solution for Cleaning Copper and Its Alloys When It Is Not Permissible or Desirable to Use an Acid Solution.

One part by weight of sodium hydroxide (caustic soda, soda lye) and three parts by weight of crystallized Rochelle salt (seignette salt, potassic sodic tartrate) is dissolved in a suitable glass (not glazed or enamelled) vessel in twenty parts by weight of distilled water. The copper specimen to be cleaned, suspended by a copper wire, is immersed in the cold alkaline solution of Rochelle salt, and occasionally raised and lowered for inspection. In a short time, the solution becomes bluish, and as the color increases in depth, the darker discolorations, incrustations, etc., begin to disappear revealing the natural brown-red color of native copper. Some flocculent sediment may be noted also floating in the solution. After the specimen has been cleaned to one's satisfaction, which may require an hour or so, the specimen is rinsed thoroughly and immersed in water for an hour or so to remove any residual solution, then rinsed again and dried in the air.

This method which gives excellent results and is highly recommended, depends for its utility and safety on the fact that while it may attack and dissolve cupric oxide (tenorite) and the compounds derived from it, it leaves unchanged both cuprous oxide (cuprite) and metallic copper.

The Mineralogical Cat

A mineralogist being asked to describe a cat has sent us the following:

Cat, Felix Ferus, Felix Domesticus, etc.

Orthorhombic.

Massive, with a smooth feel. Fibrous on exposed surfaces, the fibers being acicular and flexible, like ulexite.

Cleavage, none. Flexible, elastic. Odor, slight. H. 1 to 1.5 scratches easily. G. 1-1.2. Luster, sometimes dull, but frequently silky, splendent. Streak, blood red. Color, white, whitish or with a yellowish or reddish tinge; grey, black, often streaked, spotted or mottled. Opaque.

Comp. A very complex hydrous aluminium silicate, usually showing varying unstable amounts present of calcium, iron, phosphorous, and other minerals.

Obs. Occurs in the form of a horizontal prism of the orthorhombic system, (the macro axis b as a rule being quite extended) with a long, acicular termination connected with the macropinacoid at one end of the prism, the other end being surmounted by an isometric nodule attached to the macrodome by a many sided diametral prism. The unite prism is supported by four concretionary appendages, two from each side of the lower macrodome, although it will frequently be found resting upon its basal pinacoid. Widely distributed. Good specimes may be picked up in any town or hamlet, or on the country side. Larger specimens occasionally encountered in hilly and wooded country.

Diff. Characterized by softness, absence of cleavage and the presence in the nodule of two luminous, phosphorescent "cat's eyes," rivalling the cymophane in brilliancy and color.

THE AMATEUR LAPIDARY

Conducted by J. H. HOWARD*

504 Crescent Ave., Greenville, S. C.

Amateur and professional lapidaries are cordially invited to submit contributions and so make this department of interest to all.

*Author of—*The Working of Semi-Precious Stones.* A practical guide-book written in non-technical language for those who desire to cut and polish semi-precious stones.

Cost of Lapidary Equipment

By ARTHUR KNAPP

The reputed high cost of lapidary equipment may be deterring some from undertaking the cutting of gems or the polishing of mineral specimens.

Before proceeding further let me say that the cost will be high for those who have no mechanical bent and must have everything made for them. Of course the more that a man can do for himself and the more tools and equipment he has, the less the lapidary equipment will cost.

Amateur lapidaries may be divided into three groups, viz:—

A. Those who are interested in just enough equipment to get by.

B. Those who want to have enough equipment to work quickly and conveniently.

C. Those who have made up their mind from the start that they want a complete outfit or those who have been in group A or B and wish to improve their shop.

The following appears to be the minimum equipment with which it is possible to work and at the same time there are high-school boys who have no more and who still turn out good cabochons.

Group A.—Equipment

¼ H.P. Motor (Second Hand)	$4.00
Motor Pulley	.25
Polishing Head	.75
Belt	.20
2 Carborundum grinding wheels, 4" x ½"	1.30
	$6.50

The writer has been corresponding with a man who started out in the country where there was no electric power and who drove this outfit by bicycle power. He turned out some good work and had a lot of fun.

Group B.—Equipment

¼ H.P. Motor (Second Hand)	$4.00
Motor Pulley	.25
Grinding Head	3.00
Belt	.30
2 Carborundum grinding wheels 6" x ½"	2.50
	$10.05

Small grinding wheels, which may be turned at high speed, are recommended unless a lot of heavy work is to be done, in which case a larger motor and more expensive grinding head will be required.

Both of the above lists are made under the assumption that the grinding head will also be used in the polishing operations. If any appreciable amount of work is to be done, it is much more convenient to have the grinding and polishing units separate. The writer suggests that vertical spindle laps are the best, particularly if the lapidary expects to attempt faceted work later.

Group C—Additional Equipment

"Driver" Jack Shaft (W. T. Grant Stores)	$2.50
(Mfgr. Walker-Turner Co. Plainfield, N. J.)	
Arbor ½ x ½	1.00
	$3.50

The above is a complete unit but the following may be used also.

Group C.—(Alternate)

1—½" x 24" shaft (Drill Rod)	$ .75
2—½" Self-aligning bronze bushed hangers	2.00
1—½" x ½" arbor	1.00
1—½" shaft collar (Thrust)	.10
1—2 Speed Pulley	.25
1—V Belt	.50
	$4.60

Supplies

No. 80 to FF Carborundum	$ .50 lb.
No 600 Carborundum	.90 lb.
Tin Oxide	.60 lb.
Pumice	.20 lb.
90 E Alumina (Norton Co.)	.28 lb.
Ruby Powder (Wm. Dixon)	.70 oz.
Carborundum Buffing Powder	.50 lb.
Carborundum Grinding Wheels. 6" x ½"	1.24 ea.
Carborundum Grinding Wheels, 6" x 1"	1.75 ea.
Chaser Cement	.35 lb.
Hard felt wheels, (6" x 1")	2.00 ea.
Aluminum Discs (Driver)	.75 ea.
Cast Iron Lap	1.00 ea.
Tin Lap	1.00 ea.

The writer recommends the use of cast iron and tin laps not over one-quarter inch thick, backed by the aluminum sanding disc, rathen than laps which are heavy enough to be self supporting. This saves cost and weight on bearings.

The beginner will not need all of the above supplies. The following is enough. One pound each of No. 120 and 600 carborundum, pumice, oxide of tin and chaser cement. The cost will be about $2.50 plus transportation. He can use laps of carpet, leather or cloth in place of felt wheels at the start.

All of the prices quoted are F.O.B. large eastern centers of supply and the delivered price will depend upon the distance the user is from the source.

Home-made Equipment

Work Bench.
Laps—Linoleum, wood, carpet, leather, cloth, tin.
Lap sticks.
Splash Pans.

The home-made equipment need not stop here. Bearings can be made and have been made by pouring babbitt metal in pipe fittings. Pipe fitting bearings can be made self-aligning and are not to be laughed at. How about the shaft and bearings from an old washing machine? It is interesting how much a man with a few tools and a little ingenuity can do with a junk pile. The supplies will have to be purchased but the machinery can most of it be made at home if there is enough enthusiasm.

Fulgerite

The name Fulgerite is derived from the Latin, fulgur (Lightning).

The commonest type of fulgerite is found in dry sand deposits and take the shape of vertical tubes which may be one half an inch, or more in diameter. Generally they are elliptical in cross section, or flattened by the pressure exerted by the surrounding sand at a time when the fulgerite was very hot and plastic. These tubes run down for a number of feet through the sand, branching and lessening in diameter as they descend.

Specimens have been secured from sand deposits in Dixie County, South Carolina, 65 and 95 inches in length. Through the kindness of Mr. John A. Grenzig, of Brooklyn, N. Y., I have secured the 65 inch specimen of fulgerite which was a great attraction at his place of business.

These fused, sand elliptical tubes are fragile and most of them can only be removed in sections. The natural shifting of sand may fracture them.

It has been noticed for a number of years that lightning in severe thunder storms often strikes sand deposits. It has not been determined what attracts the lightning.

We are looking forward to the report of an extensive investigation made by the University of South Carolina, of fulgerites found in Dixie County. It is to be published in the "American Journal of Science" in the near future.

JOHN C. POHL, Jr.

A PEEK AT OUR MAIL

Improved 100%

Charlotte, North Carolina—Will renew my subscription when it expires next month. I am of the opinion that the standard of the magazine has improved 100% since you have advanced prices. It is well worth its cost several times over—*John R. Henderson.*

A Prince Writes

Beograd, Jugoslavia—I send you $1.75 as one year's renewal of my subscription for the "ROCKS and MINERALS." I hope that the journal will reach me with its usual punctuality. Always with great interest I read "ROCKS and MINERALS."—*Prince Gregory Gagarin.*

A Real Treasur

St. Paul, Minn.—Received March 1933, Opal Number, also the magazine for September; both are very interesting and I look forward to many pleasant hours with your magazine. The Opal Number is a *real* treasure and I would not part with it.—*Enos F. Hayward.*

Thank You

Middletown, Ohio—It is a pleasure to renew my subscription to your interesting magazine. "ROCKS and MINERALS" and I am enclosing my check to cover one year's renewal—*Mrs. D. Eppelsheimer.*

Page Mr. Chandler

Mt. Vernon, New York—I have enjoyed the magazine so much that I want others to have the same pleasure, which the monthly issues of ROCKS and MINERALS have given me. Please note the new subscription enclosed; also my personal renewal.—*Elsie Nourse.*

An Arctic Wanderer

Bthlehem, Pa. — Haming returned from our Arctic wanderings, well laden with specimens, we find that it is time to renew our subscription to ROCKS and MINERALS, as inclosed is the wherewith-all. Looking forward to another interesting year with your dandy magazine—*R. E. Myers.*

Can't do Without It

Custer, So. Dakota—Find enclosed check for $1.50 for another year's subscription to ROCKS and MINERALS. We wait eagerly for every copy. Can't do without it seemingly. Valuable in our work. —*Col. M. L Shade.*

What! Read All Night?

Taunton, Mass.—The back numbers of ROCKS and MINERALS duly arrived Monday (Sept. 9th), and I looked them over carefully. I read until 4:30 in the morning, so you can see how interesting they were to me.—*Mrs. Emeretta C. Williams.*

Exposes Crooks

Eden, Texas—September number just received and wish to thank you for the warning of Mineral Publications of San Francisco. Seeing their ad. I sent them a M.O. in the amount of $2 for the book, Aug. 24th, but have received neither book nor an answer in regard to same. I am writing and making complaint to the P. O. Inspector. ROCKS and MINERALS is to be commended for exposing such crooks and I will have more confidence in other advertisers in a magazine that weeds them out.—*F. G. Hoskins.*

We Are Sorry

In the last issue of ROCKS and MINERALS a rather unfortunate error occurred in the advertisement of the New Jersey Mineral Exchange, 25 Hamilton Street, Paterson, N. J. The advertisement as printed offered a collection of 25 choice New Jersey minerals, averaging 2 x 3 inches in size, for $1.00. The price should have been $10.00. It so appeared in the corrected proof when it left our office, but at the printers' the very important cypher was dropped out. We could not of course know this, or the presses would have been stopped and the correction made.

We regret any of our readers were misled. Twenty-five choice New Jersey minerals, 2 x 3 inches, for a dollar would indeed be a bargain. This is the first effor of such a nature to appear in our advertising pages. But this occurred outside the province of the Editorial office from which the advertisement had been sent to the printers in its proper form.